Balancing Act

Topic: Atmosphere

Objectives: Discover that air has weight

Grade Level: all (early grades will need adult help)

Time: 10 – 15 minutes

Materials: large balloons, string, meter sticks, tape, pins, scissors

Vocabulary:
weight
balance
balance point

Location: Magnolia Hall Courtyard

Background: When you put your hand out in front of you, a column of air is pushing down on it. Can you feel the weight of the air pressing on your hand? Does air have weight? In this activity you will compare the weight of an empty balloon to one of a balloon filled with air to determine if air has weight.

Advance Preparation: Before the students do this activity, demonstrate how to balance a meter stick by suspending it on a loop of string. Explain that when the meter stick is balanced the weight on either side of the string is exactly the same.

Procedure:

1. Select a partner to work with. With your partner collect from your teacher or activity leader two large balloons of equal size, a meter stick, some tape and a pin. Cut three pieces of string about 30 cm (12 inches) long.

2. Tie a loop in one end of one of the pieces of string. The loop should be big enough to slip over the end of the meter stick, but not too much bigger. Slip the meter stick through the loop and practice finding the balance point of the meter stick holding only to the unlooped end of the string. Leave this string looped around the meter stick.

3. Blow up the balloons. Try to make them approximately the same size. Tie each of them tightly shut with a piece of string.

4. Make a loop in the other ends of the string pieces that you have tied to each of the balloons. Slip each loop over opposite ends of the meter stick. You may need to tape the string near the ends of the meter stick to keep it from falling off.

5. Now carefully adjust the center string until you find the balance point of the meter stick. When you have found the balance point, tape the center string in place too.

6. Holding the balanced meter stick by the center string, have your partner puncture one of the balloons with the pin. Observe what happens.

Questions to think about and discuss:

1. When you balanced the meter stick with the two blown-up balloons on each end, the weights on either side of the balance point were equal. Describe what happened when the balloon burst. Why do you suppose the meter stick became unbalanced after one of the balloons deflated?

2. Which balloon was heavier after one balloon burst? How do you know? What accounts for this difference in weight?

3. Try to find the balance point of the meter stick again after one balloon is deflated. How does the balance point change? Does it move closer to the inflated balloon or farther from it? Why do you think it moves in the direction it does?